

**AMENDMENTS TO THE SPECIFICATION**

Please insert the following new paragraphs after the description of Figure 1, at page 3, line 17:

“Figure 2 describes the sequence of HEG3E(4)-2 (SEQ ID NO: 11).

Figure 3 describes the sequence of HEGM(1)-3 (SEQ ID NO: 12).

Figure 4 describes the sequence of HEGE2 (SEQ ID NO: 13).”

Please replace the paragraph beginning at page 18, line 6 and ending on page 20, line 19 with the following paragraph:

“5’ and 3’ -end gene specific primers (GSP) were designed based on the sequence obtained from previous 5’- and 3’- RACE products. 5’ GSP1 has the following sequences: 5’- GCTGAGCATTGCGAACTACGCCTTCAAC 3’, (SEQ ID NO: 9) and 3’ GSP2 has the following sequences: 5’- TAACACCGCGTGGATCCAAGCTACG 3’ (SEQ ID NO: 10). Full-length cDNAs from both *Heliothis* embryo and muscle were generated using 5’ GSP1 and 3’ GSP2 in a long distance PCR reaction which used the following cycle condition: 1 cycle of denaturation at 94°C for 1 min, and 25 cycles of denaturation at 94°C for 30sec and annealing and extension at 72°C for 5 min using *pfu* as polymerase. The amplified fragments from both *Heliothis* embryo and muscle were cloned into pCR2.1-TOPO vector (Invitrogen) to generate plasmids HEG3E(4)-2 and HEGM(1)-3. HEG3E(4)-2 has the sequence as set forth in Figure 2 (SEQ ID NO: 11). HEGM(1)-3 has the sequence as set forth in Figure 3 (SEQ ID NO: 12). ~~the following sequences (SEQ ID NO: 11):~~

——1 ctgagcattg cgaactacgc cttaaacatt gtttttttaa acaaacacccg tttttaatt  
——61 ttaatagcaac teattaaagg tttttttga aggaaagttg tgacagcaac cggagtegtt  
——121 tagaatggga ctttgttgag tggaggatg gacateccgc ggccatcatg cgcctctgta

—181 ttggtgtgt tatttgtae ceatetetea gaatgeatga aeggtggga gateaattt  
—241 egagagaagg agaagcagat eetggateag atcetgggee eegggaggta egaegceagg  
—301 atcagaceet eegggateaa eggeactgat gggecagegg tagtgagegt caatatattt  
—361 gteegaagta tateaaagat egatgaegte acaatggaat acetegtaea attaaegtth  
—421 eeggaacaat ggttagatga aeggetcaaa tteaataate ttggaggtg cetcaataae  
—481 etgaeactga etgaagecaa eagagtetgg atgeetgate tattettete caegagaag  
—541 gaaggteatt tecacaacat cateatgeeg aagetgtaea teegaatttt ccccaaege  
—601 aagetgtgt acageateeg aateteetg acetetegt gecccatgaa ceteaagtg  
—661 tacecetgg ataageagae etgetegete aggatggeta gttatggtg gaeacagae  
—721 gaettagtgt teetatgga ggaaggagae eeggtgeagg tgggaaaaa ettacacetg  
—781 ceteggttea egetggagaa gtteeteact gaetaetgea aeagtaagae taatacegtt  
—841 gaatacagtt geetgaaggt agacetgete tteaaegeg agtteagta etacetgate  
—901 cagatetaca tteegtgetg catgetggt acetgtcet ggggtteett etggetggae  
—961 caggaggetg tgeetgegag ggteteacta ggagtgaega ettaacttae aatggegace  
—1021 cagtegteag geataaege gteetacea eeggtgtcet aaeagaage cattgatge  
—1081 tggactgggt tatgteteae attegtatte ggagegetae tagagtttge getegteaee  
—1141 tatgegtete getetgaat geacegagag aacatgaaga aagegagag ggagatggaa  
—1201 geagecagea tggatgetge eteagatete ettgatacag atageaacae caettttget  
—1261 atgaacecet tggtegegg eeggtgtgt gaatecaaga tgeggcagt egagatecae  
—1321 ataececege eeggaagaa etgetgege etgtgatgt ceaagttee caegegetee  
—1381 aagaggatag acetateete caggateace ttecaettg ttttegetet gtttaacetg  
—1441 gettaetgaa tgaageagag aaeteetee tttegecaca gaaateetga agagactgaa  
—1501 caagaagtt teetaaceae aateattget atgattatae egagaattta tttataeta  
—1561 attgttga ceacaeggt ttaegtage ttggatecae geggtgta

HEGM(1)-3 has the following sequence (SEQ ID NO: 12):

—1 aggtgeggae gtetgeactt gegaategaa gtgatagaaa atagttegat gaataegga

—61 gtttgagtgg agtgatttat aatteggagg atggacatee egeggceate atgegeete  
—121 gtattggtgt tgttattgt caccatete teagaatgca tgaacgggtg gaagateaac  
—181 tttegagaga aggagaagea gatectggat cagatectgg gceegggag gtaegaegee  
—241 aggateagae ceteegggat caaeggeact ggetatgege caaegttagt ceatgteaac  
—301 atgtatetae ggtecatag caaaatagat gattacaaa tggaaacte egtacaatta  
—361 aegttteggg aacaatggt agatgaacgg etcaaattea ataattettg aggtegeete  
—421 aaatacetga caetgaetga agecaacaga gtetggatge etgatetatt ettetecaae  
—481 gagaagggaag gtcatttca caacateate atgeegaaeg tgtacateeg gatetteeee  
—541 aaeegcaae gtetgtacag cateegaate teetgaege teteegtgece eatgaacete  
—601 aagttgtace ceetggataa geagaeetge tegetcagga tggetagtta tggttggace  
—661 acagacgaet tagtgtteet atggaaggaa ggegaceegg tgeaggtgt gaaaaetta  
—721 caetgeete ggttaeget ggagaagte eteactgaet actgeaacag taagaetaat  
—781 aceggtgaat acagttgeet gaaggtagae etgetettea aaegegagti eagttaetae  
—841 etgatecaga tetacattce gtetgeatg etggteateg tgetctgggt gteettetgg  
—901 etggaceagg gagetgtgee tgegagggtc teactaggag tgacgaetti acttaaatg  
—961 gegacecagt egteaggcat caaegegte etaccacegg tgetetacae gaaagecatt  
—1021 gatgtetgga etgggttatg teteacatte gtatteggag egetactaga gtttgeete  
—1081 gteaactatg egtetegete tgaatgcae egagagaaca tgaagaage gagacgggag  
—1141 atggaageag ceagcatgga tgetgeetea gateteettg atacagatag caacaceace  
—1201 tttgetatga aaceettggt gegggggggt gtgttggat ceaagatgeg geagtgegag  
—1261 atecacatea ceegecegeg gaagaactge tgeegcetgt ggatgtccaa gtteceaeag  
—1321 egetecaaga gगतagaegt catetecagg ateacette caettgtgtt egetetgtt  
—1381 aaetgggett actgttgggg gggaagagg ggggggtgg etgetaccat gtettgeagg  
—1441 agegatgaga etattaatge tatttataag etgatacaga atgaagcaga gaaactete  
—1501 etttgegae agaaatectg aagagaetga acaagaagt tteetaacea caateattge  
—1561 tatgattata cegagaattt attttataet aattgttgg accacagggt ttaagetag

—1621-cttggateca-egcggtgta”

Please replace the paragraph beginning at page 21, line 8 and ending at page 24, line 23 with the following paragraph:

“Clone HEG3(E)-2 insert was cut out from its vector by SacI enzyme, and was labeled with  $^{32}\text{P}$  using Boehringer Mannheim’s Random Primed DNA Labeling Kit (Ca # 1004760). Part of the amplified *Heliothis virescens* embryo library was plated out on 10 large 150-mm NZY agar plate at 50,000 pfu/plate. Phage particles were transferred to nitrocellulose membranes. Membranes were denatured in a 1.5 M NaCl and 0.5 M NaOH denaturation solution for 5 minutes, neutralized in a 1.5 M NaCl and 0.5 M Tris-Cl (pH 8.0) neutralization solution for 5 minutes and rinsed in a 0.2 Tris-Cl (pH 7.5) and 2 x SSC buffer for 2 minute. DNA was crosslinked to the membranes using the Stratalinker UV crosslinker (CL-100 Ultraviolet Crosslinker, UVP). Prehybridization was performed in a 50 ml solutions containing: 25 ml of formamide, 12.5 ml of 20 x SSC, 0.5 ml of 10% SDS and 5 ml of Derhardt solution at 42C for 3 –4 hours. Labeled probes were added to the prehybridization solution at  $1.84 \times 10^5$  dpm/ml  $^{32}\text{P}$  and hybridization was continued at 42°C for 24 hours. Membranes were washed twice for 15 minutes in low stringency conditions (2 x SSC/0.1%SDS, room temperature), twice for 15 minutes in high stringency conditions (0.2 x SSC/0.1%SDS, 42C), and once for 15 minutes in higher stringency conditions (0.1 x SSC/0.1%SDS, 42C). Ten positive clones were identified and plaques were purified, and secondary and tertiary screenings were performed using the same primer with positive clones to make sure that each positive plaque was very well separated. The phagemids containing the inserts were excised following the manufacturer’s instruction (Stratagene). Two clones which have the same full-length sequences of glutamate-gated chloride channels, were designated HEGE2. The following DNA sequence (SEQ ID NO: 13) for clone HEGE2 was determined and is set forth in Figure 4.[::]

1 ACCAGGGGAA CTACGGCTTC AACATTGTTT TTTTAAACAA ACAGCGTTTT TTAATTTTAA  
61 TAGCTCTCAT TAAAGGTTTT ATTTGAAGGA AAGTTGTGAC AGCAACCGGA CTGCTTTAGA  
121 ATGGGACTTT GTTGAGTCGG AGGATGGACA TCGCGGGCGG ATCATCGCGG CTCGTATTGG  
181 TGTTCGTATT TGTACCCCAT CTCTCAGAAAT GCATGAACGG TGGGAAGATC AACTTTGAGG  
241 AGAAGGAGAA GCAGATCTCG GATCAGATCC TGGGCCCCGG GAGGTACGAC GCCAGGATCA  
301 GACCCCTCGG GATCAACGGC ACTGATGGGC CAGCGGTACT GAGCGTCAAT ATATTTGTCC  
361 GAAGTATATC AAAGATCGAT CACGTCACAA TGGAAATCTC CGTAGACTTA ACGTTTCGGG  
421 AACAAAGGTT AGATGAACGG CTCAAAATTC ATAATCTTGG AGGTCCGCTC AAATACCTGA  
481 CACTGACCGA AGCCAAACGA CTCCTGGATGC CTGATCTATT CTCTCCAAAC GAGAAGGAAG  
541 CTCATTTCCA CAACATGATC ATGCGGAAGG TGTACATCCG GATCTTCCGG AAGGGAACGG  
601 TGCTGTACAG CATCCGAATC TCCTTGACGG TCTCGTCCCG CATCAACCTC AAGTTGTACC  
661 CCTCGGATAA GCAGACCTGC TCGCTCAGGA TGGCTAGTTA TGGTTGGACC ACAGACGACT  
721 TACTGTCTCT ATGGAAGGAA GCGGACCCGG TGCAGGTGGT GAANAACCTA CACCTGCGTC  
781 GGTTCACGGT GGAGAAATTC CTCCTGACT ACTGCAACAG TAAGACTAAT ACGGCTGAAT  
841 ACAGTTGCGT GAAGGTAGAC TTGCTCTTCA AACGCGAGTT CAGTTACTAC CTCATCCAGA  
901 TCTACATTCC GTGCTGCATG CTGCTCATCG TGTCTGGGT CTCCTTCTGG CTGGACCGG  
961 GAGCTGTGCG TCGGAGGGTC TCACTAGGAG TGACGACTTT ACTTACAATG GCGAGCCAGT  
1021 CCTCAGGCAT CAACGCGTCC CTACCACCGG TGTCTACAC GAAGGCAATT GACGCTCGGA  
1081 CTGGTGTATG TCTCACATTC GTATTCCGAG CGCTACTAGA GTTCGGGCTC CTCAACTATG  
1141 CGTCTGCTCG TCACATGCGC CGAGAGAAAC TGAAGAAAGC GAGACGGGAG ATGGAAGCAG  
1201 CCAAGCATGA TGCTGCTCA GATCTCTAG ACACAGATAG CAACAGCAGC TTTCGTATGA  
1261 AACCCTTGGT GCGGCGGGGG GTGGTGGAA CCAAGATGCG CGAGTGGCAG ATCCACATCA  
1321 CCGCGCGCGG GAAGAACTGC TCGCGCGCTG GCATGTCCAA GTTCCCGCAG CGCTCCAAGA  
1381 CGATAGACCT CATCTCCAGG ATCAGCTTCC CACTTGTGTT CGCTCTGTTT AACCTGGCTT  
1441 ACTGCTGCAC GTACCTGTTT CCGGACGAGG ACGAGGAGAA GTGATTCTCC GAGTCCCTGG  
1501 AGAGGGGGCT GGGGCGGGGG GTGCAAGCTG TGGGCGGGCT CGTATGCCC TACGTGCTGT  
1561 TCGTGGTGGG GTACTGCGTG TGTCTCCGCG GCGGCGGGGG GCGGCGTTCC GCGGCGGGGG  
1621 GCGGCGGGGG GCGGCGGGGG CCGGACCCCT CCGGCGGGCG GCGGCGGGGA CGCAGACAAAG  
1681 CACAGCCGAC TAGCGGGCTC TAGCGAATC ACCCGATTCA TTATCGTGAC ATATTTATAT  
1741 ATCGTGTATT TTAATCGAGC TCTTCTCGT GGCAGCGTTA TTCCCACTCA GTATTGCGTG  
1801 GCGTTAGTGT ATTTAGTAAA GCTCAAGTGT CTATTTGTAT ATATATCTGA CCGCGGTGCG  
1861 AGTTTAGACC AAGCCTCCGT TTTTAAATTC AAGCAGTTCG AGAAAAACGG TAAAAATAGA  
1921 CTCAAATTTG ATTTGGTCAT TAAACAGCAG AACTTTTATT CCGCACTTAT AAAGTCCCTA  
1981 ATTATTTGCT TACAAAAATA AATATTTTAC TTTCGGAGAA TTAATAATTT TCGATAATTT  
2041 TACCAATCAT ATGACTCCTT GTATGCAATC GTATGTAAAG TAAACCTAGG TTAAGATATA  
2101 AGAGGAATCC CAGAGGTTCC CGCATATTAC TTTAGCCTTT AAGGTAAAGT AAATAAGGAC  
2161 TAGAATGGCA CTAATGTGTA GTGGAAGTGG GGTATTATTT AGTAGTTTTT ACTCTACAGT  
2221 ACGTGAAGTC GACTAGATCT ACTACCAAT AGAGTTGATC AATTTTCATG TCGAATGTT  
2281 CACAGATATT GTATAACCG CTGGAGGTAA ACAGCTATCA ACAATGTAAC ACCAAATAGC  
2341 ATCAGATACA AGCAAAACCA TGGAAATTTT GCTAATCGAA AAGTTGTAACT TGTTTATCTA  
2401 TGGCAGGTAT AATGCGGCTA GTAATGTATC GTGTAGTATC ATTTAGAAAC CATATTAACCT  
2461 ATTAACGACA TTATGTGAAA GAAGCAATTT ATAAAAAAA CTTATTATAA TATATATTAG  
2521 ATAAGTATTA TTAATGGGAT ATTCTCTTGC TGGGCAATTT AATATGATC TTACGTTTAA  
2581 ATAACTTTGA TCTCATAGA CGTTGCAAT CGATACCCCA AATACCTTTT CCGCATTAAG  
2641 ACGTATTATT TTAACAAATG TATTCTTCCC CGTCAATGTT TTAAGACTAC GTATCTACAT  
2701 AAAATGATGT ATTTGTCATA CAATACTATT TCAAAATGCA AGAACAACCT AAAGTGCATT  
2761 TCATTGATCT TTGTGTATGT AGATGACATT AGTATTTTAC CCAAAATAG TGATATTAAG  
2821 ATTCCAGTA AGATTCTGAG GTAATCGTA AACGTGTAAA TAGTTGGGGC TACAACCTTC  
2881 TACACCTGTG TGGCTCAGTG TAGAGTTACC TATATTTAAT ATTACAATTA TATCATTAAT  
2941 AACGAATGAT AAGATTTTAT TAACATTAAT TTCTCTGCTT GAACGTATCA CTGTAAATAT  
3001 TACTAATGT TTCTTAATTA CATTAATCAT ACATATATTA TCATCCCTTG AGCTATAGTT  
3061 CCAAGTATT CCAAAACCA AATGAAAATA AATTTCAAT TTACTTCAGC ATCAGCAAT  
3121 TGTGAAAAC TGGTGTGCTT GAATTCATTT AACAAATAGT TTTTACTTTG AATCCATGGC  
3181 TCAGGAGACA TCGTAAGGAT ATTCATTGAA ATCTATTTAG AATCTGCTGT ATGTATCATG  
3241 ACAGCTTCAA ATAAATATC ACTAATGCTG TGTTCGGCTA TTAGATACAA TAACTCGTAC  
3301 ATATTAACGT AAGCAGATTC GTTTTATTA TCGGCGGGAG AGAAGCAGTC TGTTTCTATA  
3361 ACGAAAGGT GCGCATTATC GCGTATATCA TCTTCTTGG TCTGTATAAA AATAAGACTC  
3421 AAAGACTCGG GGGAAACCCC TATATGTATA CTATCATAAC CGTTATCCTT ATTTTGACAA  
3481 AGCTCTGGGA AACGAATAG CATTTTGTAT CAATACAGCA ATTCTTCTGC ATTTTCTCTT  
3541 TCGGCGCTTT ATTTGAATTT AGCTGTGCG CACTGTGCGC AATACTCTAA TGGCTTAGAA  
3601 TTATCGTTAA TATATATTCT CCGGCTGTGA CGAGGTGTAG CATCTGCATT ATTATATTA  
3661 TGTCAATTCG TTTGGCATTC GTTGATGTGA AGGAATATTT AGCCTATGTC CAACGCTCAA  
3721 AATCTCATAG ACGTATTAGG CACACATAAG GTTACCTTTT CGTATGTATG TAAATTAATG

~~3781 GAGACTCAAT GTCTTAGTTG GTGCTATATA TACTACGATC CGAGGAGAA GTACCCAGTA~~  
~~3841 GTTTACTCAT ACATAACGCC ACTGATATCT TGTGGAGGAA ATATTATCTG CGAGACAAGT~~  
~~3901 AGACATTAGT TAAGTTTACA TATTTACAAT AAATGTTTCC ATTATTAGCA TATAACATAT~~  
~~3961 GAATGTGTTA CTGTTGAAG CAGCTTCTCA AGGTACCACC AGTAATTCCG AGATACTTGT~~  
~~4021 AGGATTTGCA TTGGATAAAC AACTTATACT AAAACGAGA TTGACTGAA TCTAAACCGC~~  
~~4081 AAATACTGTG GTCAAAATTA TTAACACTT TCAATACATG TTGTAGGCAT GTTTCTGTAA~~  
~~4141 TTTCACTTT AATTGTAAAG TCAATTAAAT CACTGTATAA TAATACATTT TCAACATATC~~  
~~4201 TCTCACTGTT AAGATTTCGG TTGGTCCAAC GACAGANTCA AATCCCAACG TAATGATGAT~~  
~~4261 CCGGGCAAAA CTAACAATA GATAGATCTC TTAANTGATT ACGTTCAAGT GGAAGAGGTG~~  
~~4321 ATGTATGAAG GAAGGTAGCA TTAAGTAACA CTGTATAATA TATTGACCAT AATTACGATT~~  
~~4381 TTAGAACTCA TAATGGACGG TTTACCTCTT AAGATTATAC AGTAAAGGTA GATAGTTTCA~~  
~~4441 TTGGTAAGCT ATGTTGTACT CGATTGCTAT CACATAACTA ATGACTGAGC TTTGTCATCT~~  
~~4501 ACTACAACCG GAGGGCGAAT ACCTCCTTCT TCTACCATTC CCATTTAATT ATAAAGAAAC~~  
~~4561 ATTGTAAGAA ATGATTTAAT AAAATATCCC AAATATCTTA AAACAAAAA AAAAAA~~  
~~4621 A"~~

Please insert the attached figures, labeled Figures 2 through 4, after Figure 1.